

Accumulator for Adaptive Sigma-Delta Modulation**Abstract**

A system and method for adaptive sigma-delta modulation. The system includes a
5 input stage that produces a difference signal representing the difference between an
analog input signal $x(n)$ and an analog feedback signal $z(n)$, the amplitude of the analog
input signal $x(n)$ within a first range $[-a, +a]$. An accumulator stage produces a
accumulated signal that is a function of an accumulation of the difference signal, the
accumulator stage transforming the accumulation of the difference signal so as to
10 increase average magnitude while ensuring instantaneous magnitude does not exceed a
predetermined value. A quantization stage produces a quantized digital signal $y_0(n)$
representing the accumulated signal. Based on the quantized digital signal $y_0(n)$, a
adaptation stage produces a digital output signal $z_0(n)$, which is converted to the analog
feedback signal $z(n)$ by a digital-to-analog converter stage.